DISCUSSION OF THE AMENDMENT

Claim 1 has been amended to recite that the alkali metal compound and/or ammonia solution is added --so as to adjust the resulting mixture to pH 8 or more, as supported in the specification at page 5, lines 14-19, and by inserting --separating the precipitate from the liquid containing the precipitate--, prior to the final forming catalyst step, as supported in the specification at page 10, lines 7-9.

New Claims 12 and 13 have been added. Claim 12 is supported in the specification at page 6, line 18 through page 7, line 2, combined with page 8, lines 9-10 and lines 14-16. Claim 13 is supported in the specification at page 11, lines 17-19.

No new matter has been added by the above amendment. With entry thereof, Claims 1-13 will be pending in the application.

REMARKS

Applicants thank the Examiner for the courtesy extended to Applicants' attorney during the discussion held April 21, 2003, in the above-identified application. During the interview, Applicants' attorney explained the presently-claimed invention and why it is patentable over the applied prior art, and discussed aspects of the above-discussed amendment. No agreement was reached.

The rejection of Claims 1, 2, 4-6, and 8-11 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,165,296 (Ishii et al), is respectfully traversed.

The present invention relates to a process for producing a catalyst, using a compound recovered from a used catalyst, as a source material for the catalyst. As recited in above-amended Claim 1, the present invention is a process for producing a catalyst, which comprises dispersing, in water, a used catalyst containing at least molybdenum, an A element (at least one element selected from the group consisting of phosphorus and arsenic) and an X element (at least one element selected from the group consisting of potassium, rubidium and cesium), adding thereto an alkali metal compound and/or ammonia solution so as to adjust the resulting mixture to pH 8 or more, then adding thereto an acid so as to adjust the resulting mixture to pH 6.5 or less to generate a precipitate containing at least said molybdenum and said A element, separating the precipitate from the liquid containing the precipitate, and forming a catalyst from the precipitate as a source material for said catalyst.

In the present invention, in order to effectively utilize a used catalyst, a compound suitable for a source material for catalyst, which may be a salt of an X element of a heteropolyacid and/or an ammonium salt of a heteropolyacid in particular, is recovered from the used catalyst.

The present invention is not a process for regenerating a catalyst directly as Ishii et al. For example, as shown by the Examples herein, all recovered compounds are a salt of an X

element of a heteropolyacid and/or an ammonium salt of a heteropolyacid. The recovered compound does not contain copper which was present in the used catalyst (Example 2 and 5). Vanadium is an element constituting a heteropolyanion. $PMo_{11}VO_{40}^{4-}$ and $PMo_{10}V_2O_{40}^{5-}$ are well known as heteropolyanions.

Ishii et al discloses a phosphorous-molybdenum-alkali metal-containing catalyst for the gas-phase oxidation of an unsaturated aldehyde to an unsaturated carboxylic acid, which is regenerated by treating it with an aqueous solution containing ammonia and hydrogen peroxide or ozone. Ishii et al further discloses that nitrate ion may be present during regeneration, which increases the effect of the regeneration (column 3, lines 1-2). According to Ishii et al, it is thought that the increased effect is due to nitrate ion combining with ammonium ion to form ammonium nitrate which is removed during a calcining treatment (*id.* at lines 2-5). As the Examiner notes, Ishii et al discloses nitric acid or ammonium nitrate as a source of nitrate ion (column 2, lines 36-39). The solution is then heated, and then the solvent is evaporated, leaving a solid residue (column 3, lines 51-56).

Regardless of the source of Ishii et al's nitrate ion, Ishii et al neither discloses nor suggest the presently-recited steps of adding an alkali metal compound and/or ammonia solution so as to adjust the resulting mixture to pH 8 or more, then adding thereto an acid so as to adjust the resulting mixture to pH 6.5 or less. It is noted that Applicants are claiming a process, not a product, and such claims must be treated accordingly. Ishii et al does not disclose or suggest any adjustments. The Examiner appears to suggest that the presently-recited adjustments are inherent in carrying out Ishii et al's process. However, if any adjustment occurs in Ishii et al, it is opposite to that of the present claims, in that Ishii et al discloses a general procedure for carrying out regeneration which involves combining their deactivated catalyst with a nitrate ion source **prior to** adding aqueous ammonia (column 3, lines 40-47). See also all the examples therein, wherein in each one where nitrate ion was

added, it was added before the ammonia. Thus, with such an adding order in Ishii et al, the pH increases from a low value to a high value, resulting in an alkaline mixture. In the present invention, on the other hand, the pH decreases from a higher value to 6.5 or less, and the mixture becomes acidic. Moreover, rather than a precipitate forming, as required by the present claims, Ishii et al evaporates a solvent, leaving a solid residue.

Thus, as discussed above, Ishii et al does not disclose or suggest adjusting the resulting mixture to pH 8 or more after dispersing or dissolving a used catalyst in water, and then adjusting the resulting mixture of pH 6.5 or less. Also, Ishii et al does not disclose or suggest dissolving a used catalyst in water, then precipitating a compound which contains only a desired element, and then separating the precipitate from the liquid containing the precipitate to obtain a compound suitable for a source material for catalyst.

In Ishii et al, a used catalyst is dissolved in water, and then the mixture is evaporated to dryness, leaving a solid residue. The solid residue (the regenerated catalyst) obtained by the method inevitably contains all elements making up the used catalyst. In addition, the solid residue (the regenerated catalyst) obtained by the method contains an excess ammonium root, which did not constitute the precipitate (an ammonium salt of a heteropolyacid) and was present in liquid solution. Therefore, a compound suitable for a source material for catalyst, which contains only a desired element, would not be obtained by the method of Ishii et al.

In the Examples of Ishii et al, the aqueous solution containing the used catalyst contains a large quantity of ammonium root, and the obtained solid residue (the regenerated catalyst) contains a large quantity of ammonium root. Initial activity of a catalyst containing a large quantity of ammonium root may be low.

In producing a catalyst, the performance of the obtained catalyst is influenced by the order in which source materials for elements constituting the catalyst are added. By the present invention, source materials including the precipitate recovered from the used catalyst

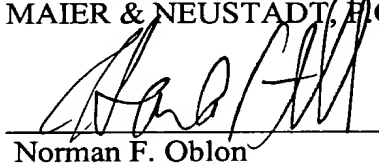
can be added in the appropriate order. In contrast, by the method described in Ishii et al, the order in which source materials are added cannot be changed, and consequently the obtained catalyst may have a relatively short catalyst life in some cases.

For all the above reasons, it is respectfully requested that the rejection over Ishii et al be withdrawn.

Applicants gratefully acknowledge the Examiner's indication of allowability of the subject matter of Claims 3 and 7. Nevertheless, Applicants respectfully submit that all of the presently-pending claims in this application are in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Harris A. Pitlick
Registration No. 38,779

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)
NFO/HAP/cja